What is claimed is:

1. A method for determining the sequence of a DNA, wherein (i) about 1000 or fewer copies of the DNA are bound to a solid substrate via 1,3-dipolar azide-alkyne cycloaddition chemistry and (ii) each copy of the DNA comprises a self-priming moiety, comprising performing the following steps for each nucleic acid residue of the DNA to be sequenced:

(a) contacting the bound DNA with DNA polymerase and four photocleavable fluorescent nucleotide analogues under conditions permitting the DNA polymerase to catalyze DNA synthesis, wherein (i) the nucleotide analogues consist of an analogue of G, an analogue of C, an analogue of T and an analogue of A, so that a nucleotide analogue complementary to the residue being sequenced is bound to the DNA by the DNA polymerase, and (ii) each of the four analogues has a pre-determined fluorescence wavelength which is different than the fluorescence wavelengths of the other three analogues;

(b) removing unbound nucleotide analogues; and

(c) determining the identity of the bound nucleotide analogue,

thereby determining the sequence of the DNA.

2. The method of claim 1, further comprising the step of photocleaving the fluorescent moiety from the bound nucleotide analogue following step (c).

3. The method of claim 1, wherein the solid substrate is glass or quartz.

4. The method of claim 1, wherein fewer than 100 copies of the DNA are bound to the solid substrate.

5. The method of claim 1, wherein fewer than 20 copies of the DNA are bound to the solid substrate.

6. The method of claim 1, wherein fewer than five copies of the DNA are bound to the solid substrate.

7. The method of claim 1, wherein one copy of the DNA is bound to the solid substrate.

8. A method for determining the sequence of an RNA, wherein (i) about 1000 or fewer copies of the RNA are bound to a solid substrate via 1,3-dipolar azide-alkyne cycloaddition chemistry and (ii) each copy of the RNA comprises a self-priming moiety, comprising performing the following steps for each nucleic acid residue of the RNA to be sequenced:

(a) contacting the bound RNA with RNA polymerase and four photocleavable fluorescent nucleotide analogues under conditions permitting the RNA polymerase to catalyze RNA synthesis, wherein (i) the nucleotide analogues consist of an analogue of G, an analogue of C, an analogue of U and an analogue of A, so that a nucleotide analogue complementary to the residue being sequenced is bound to the RNA by the RNA polymerase, and (ii) each of the four analogues

has a pre-determined fluorescence wavelength which is different than the fluorescence wavelengths of the other three analogues;

(b) removing unbound nucleotide analogues; and

(c) determining the identity of the bound nucleotide analogue,

thereby determining the sequence of the RNA.

9. The method of claim 8, further comprising the step of photocleaving the fluorescent moiety from the bound nucleotide analogue following step (c).

10. The method of claim 8, wherein the solid substrate is glass or quartz.

11. The method of claim 8, wherein fewer than 100 copies of the RNA are bound to the solid substrate.

12. The method of claim 8, wherein fewer than 20 copies of the RNA are bound to the solid substrate.

13. The method of claim 8, wherein fewer than five copies of the RNA are bound to the solid substrate.

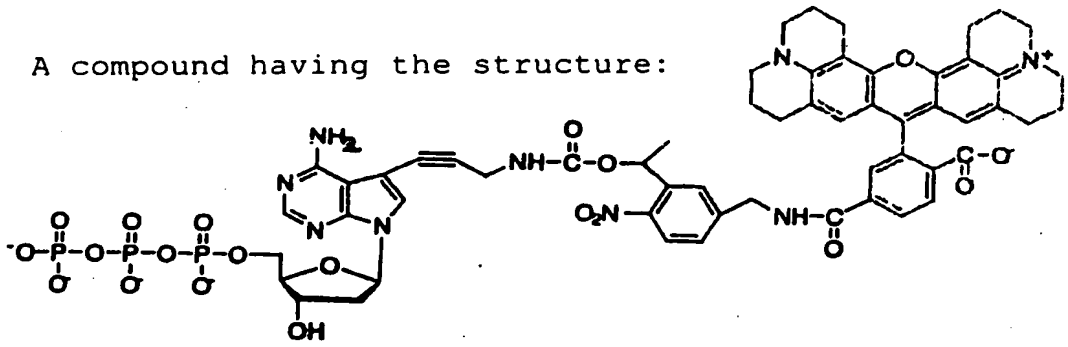
14. The method of claim 8, wherein one copy of the RNA is bound to the solid substrate.

15. A composition of matter comprising a solid substrate having a DNA bound thereto via 1,3-dipolar azide-alkyne cycloaddition chemistry, wherein (i) about 1000 or fewer copies of the DNA are bound to the

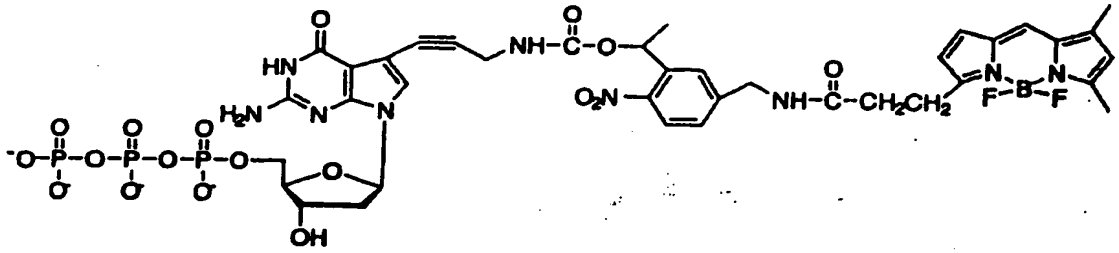
solid substrate, and (ii) each copy of the DNA comprises a self-priming moiety.

16. A composition of matter comprising a solid substrate having a RNA bound thereto via 1,3-dipolar azide-alkyne cycloaddition chemistry, wherein (i) about 1000 or fewer copies of the RNA are bound to the solid substrate, and (ii) each copy of the RNA comprises a self-priming moiety.

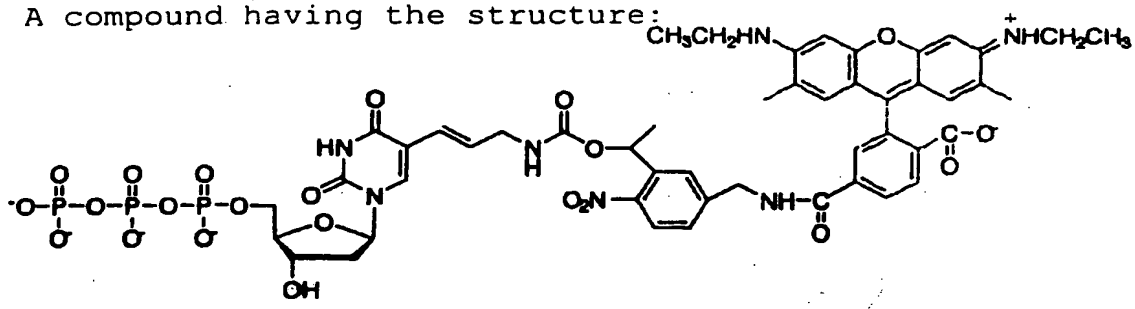
17. A compound having the structure:



18. A compound having the structure:



19. A compound having the structure:



20. A compound having the structure: